

Sleeping Bear Dunes

National Park Service
U.S. Department of the Interior

Sleeping Bear Dunes
National Lakeshore



Fossilized coral- Petoskey stone



Freezing and thawing of the Lakeshore



Endangered species- Pitcher's thistle

The Importance of Climate Change

History of change

360 million years ago, no ice caps graced the poles and Sleeping Bear Dunes National Lakeshore lay beneath a shallow sea where Petoskey coral lived and died before it became the fossilized stone we know today. If you were standing here 20,000 years ago you would be crushed under glacial ice a mile deep. Geologically speaking, the land where you stand now is a newborn baby shaped by climate change in only the past 11,000 years. This nationally beloved place has experienced global climates both warm and cool several times in the last few million years, but rarely changing as rapidly as in the last one hundred.

Speed of change

If our climate has always changed on its own, what's the big deal now, and why do humans get the blame?

It isn't the change that startles scientists, it's the speed. Going down ten flights in a slow elevator shouldn't alarm you but going down at 100 miles an hour should. Humans and every other species of living thing are adaptable, but we need time to adapt.

The Earth's climate is very complex and involves many variables. However, the close correlation

between the rapid rise of average global temperature and the rapid rise of greenhouse gases released into the atmosphere by humans, show scientists a cause and effect relationship.

Global climate is rapidly changing and these changes are caused by our energy consumption habits.

What are greenhouse gases?

Water vapor, carbon dioxide (CO₂), methane (CH₄), and other gases trap heat in our atmosphere like glass in a greenhouse.

You experience the greenhouse effect in miniature when you leave your car sitting in the sun. The glass, like our atmosphere, acts as a kind of one-way passage, letting in the sun's rays, but not letting out all the heat.

As biological lifeforms, we humans depend on a layer of these greenhouse gases in our atmosphere to moderate temperatures. With too thin a layer, Earth would be like Mars with extreme deep freezing temperatures, with too thick a layer Earth would be like Venus, four times hotter than boiling water.

Earth has been just right for us to survive for thousands of years.

How does climate change affect my Sleeping Bear Dunes?

"Tug on anything at all and you'll find it connected to everything else in the universe." –John Muir

This is especially true of Earth's climate. It is very intricate and involves the influences of air, land, and water on one another.

Relationships

Our region's average temperature warmed by almost 4°F (2°C) in the 20th century. That seemingly small increase has meant shorter winters, longer growing seasons, decreased snow cover, ice forming later and melting earlier, warmer lake temperatures, and more.

Longer growing seasons give a boost to pests such as mosquitos, biting flies and invasive species, while giving the boot to native species who can't keep up with the rapid changes in their home habitats. If their habitats shift faster than they can, they will become extinct.

Decreased snow cover means less skiing, snowshoeing and other outdoor winter activities; and less protective covering for plants and animals that depend on its insulation to survive the winter.

Less ice cover exposes shorelines to winter storms and erosion, and makes ice fishing and ice skating more dangerous and less accessible. When water temperatures warm, evaporation increases; lowering lake levels, and increasing the need for dredging docks and harbors.

Warmer water temperatures also mean more algae and bacterial growth, less dissolved oxygen, less cold water fish (salmon, trout), and significant changes in overall species composition.

What will happen if we don't slow this change?

Global climate, like weather, has too many variables for scientists to make exact predictions. However, by observing the effects of these rapid changes, climate scientists make forecasts based on data and trends, just as meteorologists do.

If humans fail to reduce greenhouse gas emissions, these forecasts predict more rapid warming, more severe weather events like storms, floods and droughts; mass extinctions, increased spread of disease, sea level rise, and lots of other undesirable things.

What can I do?

Climate change affects all of us and each of us affects climate. Since we had the power to speed this change, we have the power to slow it. If you make your effect a positive one, forecasts can change.

And lucky for us, most changes that are good for our global climate are even better for us, from saving money to improving our health.

The list to the right is just a sampling of little changes you can make to preserve and protect your Earth, your National Parks and Yourself.

Your Park has already made changes to lower emissions and by becoming a Climate Friendly Park, we plan on making even more.



Solar panels on North Manitou Island

- Walk, bike, use public transportation, and carpool with friends whenever possible
- Convert lights to energy efficient bulbs and buy energy efficient appliances
- Turn off unnecessary lights
- Unplug devices and chargers when not in use
- Support renewable energy sources
- Buy local products whenever possible
- Buy products that feature reusable, recyclable, or reduced packaging
- Reduce, reuse, recycle
- Encourage others to do some of the actions above (they like saving money too!)
- Learn more about your climate and habitat
- Volunteer

For more information go to
www.webrangers.us/activities/global_connect
www.nps.gov/climatefriendlyparks/
www.epa.gov/climatechange/
www.globalchange.gov/
www.ipcc.ch/